Amendments to the Specification

Please cancel the Abstract and replace with the replacement Abstract attached hereto as Appendix A.

Please insert the following paragraph on page 6, under the heading "Brief Description of the Drawings":

--The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawings will be provided by the U.S. Patent and Trademark Office upon request and payment of the necessary fee.--

Please replace the paragraph beginning at page 21, line 24 with the following amended paragraph:

-- cDNA was synthesized from 7μg total RNA using Moloney murine leukemia virus (M-MuLV) reverse transcriptase (Promega) in 1x transcription buffer containing 0.5 μmol/l oligo $dT_{(12-18)}$ (GIBCO/BRL) and 400 μmol/l dNTPs. Aliquots of cDNA were diluted 1:5 for IPF1/PDX1, neurogenin 3 (Ngn3), octamer-binding transcription factor (Oct4), Glut-1 and Glut-2, or 1:2 for insulin and islet specific glucokinase (GK). Subsequent PCR reactions were carried as follows: 2.5 μl (for IPF1/PDX1, Ngn3, Oct4) or 5 μl cDNA (for others), 1x PCR buffer, 400 μmol/l dNTPs, 100 ng of each primer pair and 1 U Taq polymerase. After initial hot start for 5 min, amplification continued with 28 cycles for β-actin, 31 cycles for Glut-1, 40 cycles for Glut-2, 38 cycles for glucokinase, 36 cycles for insulin, 37 cycles for Oct4, 35 cycles for IPF1/PDX1 and Ngn3. Denaturation steps were at 94°C for 1 min, and annealing at 58, 52, 50, 67, 62, 55, 52 and 60°C, respectively, for 1 min, and extension at 72°C for 1 min, and a final polymerization for 10 min. The amplified products were separated on 1.5% agarose gels. Each PCR reaction was performed in duplicate and under linear conditions. The forward and reverse primer sequences used for determination of human insulin, IPF1/PDX1, Ngn3 and β-actin were as follows: hIns: 5'-GCC TTT GTG AAC CAA CAC CTG-3' (SEQ ID NO: 1); 5'-GTT GCA GTA GTT CTC CAG CTG-3' (261 bp fragment) (SEQ ID NO: 2); IPF1: 5'-CCC ATG GAT GAA GTC TAC C-3' (SEQ ID NO: 3); 5'-GTC CTC CTC CTT TTT CCA C (262 bp fragment) (SEQ ID NO: 4); Ngn3: 5'-CTC GAG GGT AGA AAG GAT GAC GCC TC-3' (SEQ ID NO: 5); 5'-ACG CGT GAA TGG GAT TAT GGG GTG GTG-3' (948 bp fragment) (SEQ ID NO: 6); β-Actin: 5'-CAT CGT GGG CCG CTC TAG GCA C-3' (SEQ ID NO: 7); 5'-CCG GCC AGC

CAA GTC CAG GAC GG-3' (508 bp fragment) (SEQ ID NO: 8), respectively. The primer sequences used for determination of Glut-1, Glut-2, GK and Oct4 were as previously described (Seino et al., 1993; Koranyi et al., 1992; van Eijk et al., 1999), the amplified fragments being 310, 398, 380 and 320 bps, respectively.--

Please replace the heading beginning at page 23, line 5 with the following:

--Example 2: Insulin-producing cells derived from [[form]] spontaneous differentiation of H9 line of human ES cells--

Please replace the paragraph beginning at page 32, line 22 with the following amended paragraph:

-- A DNA fragment containing 327 bp of the 5'-flanking region and 30 bp of exon 1 of the human insulin gene was amplified using the polymerase chain reaction (PCR). The following oligodeoxynucleotides were used as primers:
5'-GCG GAG CTC TCT CCT GGT CTA ATG TGG AA-3' (SEQ ID NO: 9);
5'-GCG CTC GAG CTC TTC TGA TGC AGC CTG TC-3' (SEQ ID NO: 10).--